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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,048	06/20/2003	Dimitri Chernyak	018158-021800US	8453
20350	7590	12/15/2005	EXAMINER	
TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834			SANDERS JR, JOHN R	
			ART UNIT	PAPER NUMBER
			3735	

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/601,048

Applicant(s)

CHERNYAK ET AL.

Examiner

John R. Sanders

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/16/04, 01/24/05</u> . | 6) <input checked="" type="checkbox"/> Other: <u>IDS: 8/15/05</u> .                     |

**DETAILED ACTION*****Drawings***

1. The drawings are objected to because FIGS. 9-11 are considered to be of poor quality. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

2. Claim 19 objected to because of the following informalities: the limitation “the correction ablation pattern” lacks antecedent basis. Appropriate correction is required.
3. Claim 25 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the

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claim(s) in independent form. The laser system is described as being “in communication with the system of claim 24” and as such it is unclear whether the system specified in claim 24 is positively claimed in claim 25.

***Claim Rejections - 35 USC § 102/103***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5, 7-10, 13-15, 17-26 and 29-35 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent Application Publication No. 2001/0041884 A1 to Frey et al (“Frey”).

Frey discloses a method for determining the wavefront aberrations of the eye, determining an optical correction for the eye based on said wavefront aberrations, and subsequently determining a laser ablation profile for ablating the eye to achieve said optical correction (abstract). Frey discloses aligning the eye with the probe beam path for wavefront measurement based upon the video image of the eye from a video imaging path (paragraph 31). Frey discloses projecting light for reflection from the retina to be detected using a Hartmann-Shack wavefront sensor in order to measure across the pupil of the eye a set of local gradients

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corresponding to displaced spots produced by the lenslets in the Hartmann-Shack sensor (paragraphs 90-108). Frey discloses reconstructing the wavefront surface from the measured gradients with Zernike polynomials, but also discloses that other mathematical approaches can be used to approximate the distorted wavefront surface, including Fourier (paragraph 108).

Frey discloses determining a laser ablation treatment profile from the reconstructed wavefront, said laser treatment ablating a specified thickness from the cornea to effect the optical correction (paragraphs 199-219). Though Frey is primarily concerned with a reconstruction method based on Zernike polynomials, Frey expressly discloses the applicability of Fourier-based reconstruction. Thus, if Frey does not necessarily anticipate applying a Fourier transform to the measured gradients, one of ordinary skill in the art at least would find it obvious to do so based upon the suggestion by Frey of Fourier reconstruction as a viable alternative to Zernike polynomial reconstruction.

7. Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frey in view of U.S. Patent No. 5,745,309 to Salmon ("Salmon").

Frey discloses the above limitations but does not expressly disclose adding a mean gradient field to remove a tilt from the reconstructed surface. Salmon teaches a method for removing tilt control in adaptive optic systems wherein an average displacement error or gradient from the gradients measured by a Hartmann-Shack sensor is removed from the measurement (col. 5, lines 32-58). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Frey to add a mean gradient field to the reconstructed wavefront surface, as taught by Salmon, in order to remove an average tilt from the surface.

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8. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frey in view of *Wavefront reconstruction using iterative Fourier transforms*, Applied Optics, 30:11 1325-1327 (1991) to Roddier et al ("Roddier"), of record.

Frey discloses applying Fourier-based reconstruction as previously discussed but does not expressly disclose applying a discrete Fourier decomposition and an inverse discrete Fourier transform. Roddier teaches wavefront construction using iterative Fourier transforms wherein an FFT algorithm is used to take the transform of arrays of sampled  $x$  and  $y$  slopes and then an inverse Fourier transform is applied (page 1325, column 2). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Frey to apply the discrete Fourier transform and inverse Fourier transform as taught by Roddier in order to reconstruct the wavefront from the sampled wavefront slopes.

9. Claim 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frey in view of U.S. Patent No. 5,777,719 to Williams et al. ("Williams").

Frey discloses the above limitations but does not expressly disclose an adaptive optical element coupled to the processor. Williams teaches a device for measurement of wavefront aberrations of the eye with a Hartmann-Shack camera wherein a deformable mirror (118, fig. 1) is used in feedback with the processor to determine a wavefront profile for the eye. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Frey to incorporate an adaptive optical element, as taught by Williams, in order to obtain stable wavefront measurements over time.

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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John R. Sanders whose telephone number is (571) 272-4742.

The examiner can normally be reached on M-F 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ali Imam can be reached on (571) 272-4737. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



6 December 2005



**ALI IMAM**  
**PRIMARY EXAMINER**